FINAL REPORT

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SAVE THE BAY SALT MARSH ADAPTATION PROJECTS: ENHANCING THE RESILIENCY OF MARSHES IN THE SALT PONDS REGION

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EXECUTIVE SUMMARY

Funding from the Narragansett Bay Estuary Program's RFQ for shovel-ready watershed restoration projects which further implement the Comprehensive Conservation and Management Plan supported Save The Bay's (STB) the construction and field work phases of the ongoing implementation of permitted, shovel ready salt marsh adaptation and restoration projects which brought together private and public partners to ensure the long-term health, resilience, and viability of coastal Rhode Island's and Narragansett Bay's salt marshes. These purpose of these multi-phase projects was to deliver tangible, and measurable, results towards the ongoing adaptation of our salt marshes in the face of accelerated sea level rise. As these projects are ongoing, no long-term monitoring was conducted as part of this project.

Accelerated sea level rise over the last two decades is impacting the ability of marshes to keep pace with sea level rise, threatening the ecological health and viability of salt marshes throughout the region and impacting critical habitat and essential ecosystem functions. Between 2012 and 2013, STB conducted a salt marsh assessment, documenting impounded water on the marsh surface, vegetation die-off, and degradation of marsh substrate throughout Narragansett Bay and the southwest coastal salt ponds. Without healthy plants on the marsh platform to trap sediment and increase marsh surface elevation through accumulation of below ground biomass, the surface of the marsh subsides and converts to shallow standing water. These shallow areas of standing water do not support fish and create mosquito breeding habitat. Assessment of aerial photos confirm the transition from vegetated marsh to open water in recent years. These impacts pose a profound threat to the ecological health of coastal wetlands including the loss of native species that rely on salt marshes as breeding habitat.

To address rapidly changing conditions in the region's salt marshes due to accelerated sea level rise, STB and project partners have conducted 14 salt marsh adaptation projects over the past 10 years. The goal of these projects is to allow the marsh surface to revegetate and to prevent further subsidence, thereby restoring the health and function of salt marshes while helping marshes adapt to rising seas. Vegetation monitoring results of these projects have shown greater vegetation coverage and less standing water on the marsh surface. These projects have reduced mosquito-breeding habitat, improved the condition of the marsh migration corridor and helped maintain key habitats for salt marsh dependent species such as the salt marsh sparrow.

Funding through this grant supported STB's work implementing permitted, multi-phase salt marsh adaptation projects at three salt marshes in Narragansett Bay and the salt pond region. Sites included: Ninigret marsh owned by DEM in Charlestown and two marshes on Winnapaug Pond, one on the back barrier owned by DEM and the other on the northern side owned by the Westerly Land Trust and Audubon Society of RI.

During the 19-month grant period, from November 2019 to April 2021, STB collaborated with RIDEM's Mosquito Abatement Coordinator, RIDEM Division of Fish and Wildlife and property owners on conducting the salt marsh adaptation projects including the excavation of runnels with RIDEM's low ground pressure excavator and by hand at the three salt marsh adaptation projects. Ongoing maintenance of the runnels will continue after the grant period on coordination with partners.

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1. PROJECT SYNOPSIS

Rhode Island's salt marshes are suffering the impacts of accelerated sea level rise and anthropogenic impacts to the marsh including ditching, associated ditch spoils and agricultural embankments and exhibit signs of significant degradation. Under these conditions, water becomes trapped on the marsh platform causing the vegetation to become stunted or die off and the peat to become unconsolidated. As sea level rise has accelerated over the past three decades, salt marsh have not been able to accrete or build elevation quickly enough to keep pace with sea level rise, threatening the ecological health and viability of salt marshes throughout the region.

Between 2012 and 2013, STB conducted a salt marsh assessment which documented impounded water on the marsh surface, vegetation die-off, and degradation of marsh substrate throughout Narragansett Bay and the coastal salt ponds (Ekberg et. al 2017). Without healthy plants on the marsh platform to trap sediment and increase marsh surface elevation through accumulation of below ground biomass, the surface of the marsh subsides. These shallow areas of standing water do not support fish and create mosquito breeding habitat. Assessment of aerial photos confirm the transition from vegetated marsh to open water over the past 30 years. These impacts pose a profound threat to critical breeding habitat for salt marsh dependent species including the threatened salt marsh sparrow.

To address rapidly changing conditions in the region's salt marshes due to accelerated sea level rise, STB and project partners have conducted 14 salt marsh adaptation projects over the past 10 years. The goal of these projects is to allow the marsh surface to revegetate and to prevent further subsidence, thereby restoring the health and function of salt marshes and helping marshes adapt to rising sea level. Vegetation monitoring results of these projects have shown greater vegetation coverage and less standing water on the marsh surface. These projects have reduced mosquito-breeding habitat, improved the condition of the marsh migration corridor and helped maintain key habitats for salt marsh dependent species such as the salt marsh sparrow.

Under this grant funding, STB conducted permitted, multi-phase salt marsh adaptation projects at three salt marshes in the salt pond region of Rhode Island. Sites included: Ninigret marsh owned by the RI Department of Environmental Management (RIDEM) in Charlestown and two marshes on Winnapaug Pond, one on the back barrier owned by RIDEM and the other owned by the Westerly Land Trust and Audubon Society of RI.

The short-term goals of these adaptive management projects are to:

1. Restore tidal hydrology in salt marshes impacted by accelerated sea level rise and past agricultural impacts from ditching and embankments by installing shallow runnels in the marsh platform to facilitate drainage of impounded water;
2. Allow early successional marsh vegetation to recolonize the marsh platform and
3. Reduce mosquito breeding habitats in stagnant water on the marsh surface.

The long-term goals of these adaptive management projects are:

1. To provide higher elevation areas through the placement of excavated peat in small islands that form structured microtopography. These islands could become nesting habitat for salt marsh dependent species such as the salt marsh sparrow and the willet;

2. Facilitate marsh migration by reducing impounded water in the marsh migration corridor;
3. Improve the functions and ecosystem services that salt marsh habitat provides to the salt ponds and surrounding community and
4. Provide ongoing public education through community outreach, public signage where appropriate and stories in local press and through STB's social media and newsletters.

Under this grant, STB's deliverables were completed throughout the 19-month project period. From November 2019 to April 2021 (initially April 2020), STB collaborated with RIDEM's Mosquito Abatement Coordinator, RIDEM Division of Fish and Wildlife and property owners on conducting the salt marsh adaptation projects including the excavation of runnels with RIDEM's low ground pressure excavator and by hand at the three salt marsh adaptation projects. Due to the COVID-19 pandemic causing delays with recruiting volunteers and interns to conduct the hand digging of the runnels, STB received an extension of this grant through June 2021. This extension supported the work of STB staff and partners for an additional growing and field season in the three marsh locations.

During June and July 2020, no marsh work was conducted due to the breeding season.

From August 2020 – March 2021 STB staff and partners continued the phased approach to runnel installation including maintaining and extending the runnels by hands with interns, assessing the recolonization of the peat islands, developing plans for additional adaptive management work with RIDEM's low ground pressure excavator and drafting interpretive signage to be placed on site.

In April 2021, at the Westerly Land Trust and Audubon Society of RI marsh, we used RIDEM's low ground pressure excavator to extend the runnels installed in the spring of 2020. The extent of standing water was so significant in 2020, we conducted the excavation in phases. We also installed runnels in a section of the marsh that we did not have time to visit in 2020 due to time of year restrictions. Conducting the project in phases allowed us to assess the amount of drainage needed and allowed the unconsolidated sediment to dewater and stabilize with vegetation.

Sites	Timeline of Deliverables
Winnapaug Pond: RIDEM Misquamicut	Excavated runnels. Engaged volunteers (including students) in digging of runnels. Timeline: Work completed throughout the 19-month grant period. Ongoing maintenance of the runnels in coordination with RIDEM will continue after the grant period.
Winnapaug Marsh: Westerly Land Trust/Audubon marsh	Excavated runnels in partnership with Westerly Land Trust and RI Audubon Society staff. Timeline: Work completed throughout the 19-month grant period. Ongoing maintenance of the runnels in coordination with the Westerly Land Trust and RI Audubon Society will continue after the grant period.
Ninigret Pond marsh: RIDEM	Excavate runnels in marsh and marsh migration corridor.

	Timeline: Work completed throughout the 19-month grant period. Ongoing maintenance of the runnels in coordination with RIDEM will continue after the grant period.

2. TASKS COMPLETED

During the grant period, STB coordinated the implementation of the marsh adaptation projects with RIDEM's Mosquito Abatement Coordinator in consultation with the property owners of the marshes - RIDEM Division of Fish and Wildlife, Westerly Land Trust and the Audubon Society of Rhode Island. STB had secured the necessary permits from CRMC, RIDEM and ACOE for each of the projects prior to this grant award. Tasks completed at each project site are detailed below.

WINNAPAUG POND: RIDEM MISQUAMICUT

- Finalized scope of work and contract with local contractor for operating the excavator.
- In November 2019, worked with high school students from the Greene School on trash removal from the salt marsh, salt marsh seed collection and digging a runnel in the salt marsh. Re-engaged students from the Greene School – masked and socially distanced – in November 2020 to extend and maintain runnels.
- Worked with RIDEM and the Town of Westerly to relocate stones to limit vehicle access to the salt marsh from an intertidal area to a higher elevation area. The current location of the stones was causing scour holes to form and the new location would prevent cars from driving into the intertidal area the tide line onto the salt marsh. Past vehicle use of the marsh compressed the marsh peat and formed ruts that created mosquito breeding habitat.
- Oversaw the excavation of the runnels with RIDEM's excavator in March of 2020.
- Coordinated site visit with RIDEM's Water Quality Certificate program and a new biologist from RIDEM's Division of Fish and Wildlife to discuss restoration approach, phasing of projects to assess the extent of the drainage and prevent loss of unconsolidated sediment from the impounded water areas, and the placement of excavated sediment to create microtopography on the marsh surface.
- Conducted masked and distanced hand digging and maintenance of runnels with STB staff and family members in lieu of the organization's pause on engaging volunteers and interns amid the COVID-19 pandemic. Lowered the marsh sill to allow more drainage of the marsh platform and regularly assessed the areas the excavated peat was placed to create structured microtopography. The excavated peat placement revegetated during one growing season and the vegetation has recolonized areas where there had been impounded water or bare areas.

- In the spring of 2021 with interns and a volunteer salt marsh steward, maintained runnels including removing sediment and wrack. Worked with RIDEM biologist to assess the long-term maintenance of runnels and installation of an interpretive sign at the entrance of the marsh. Installed additional runnels in the highly degraded grid ditch section of the salt marsh that was not accessible for the low ground pressure excavator due to the unstable condition of the peat.

Excavation with low ground pressure excavator at Winnapaug: Misquamicut

Microtopography at Winnapaug: Misquamicut; excavated peat island revegetated after 1 year

Winnapaug Marsh: Westerly Land Trust/Audubon marsh

- Conducted field work in November 2019 to assess construction access for the low ground pressure excavator. The low ground pressure excavator was utilized throughout the two year grant period to dig runnels in the marsh.
- Conducted vegetation monitoring at 8 transects along the marsh. Monitoring activities were not funded by the SNEP funds.
- Conducted masked and distanced hand digging and maintenance of runnels with STB staff and family members in lieu of the organization's pause on engaging volunteers and interns amid the COVID-19 pandemic during the spring of 2020.
- Assessed the sills that were created during the first phase of the project and lowered them by hand to allow for more drainage on the marsh platform. After each visit, we assessed the extent of drainage provided by the runnels and extended the runnels into the impounded water areas.
- Regularly shared restoration project information with the Westerly Land Trust for their newsletter.
- Drought conditions during the summer and fall of 2020 allowed for staff to assess the extent of impounded salt water versus groundwater. Staff extended runnels further inland and the vegetated sills at the mouth of the runnels were lowered to allow for more drainage.
- Conducted a training of salt marsh stewards with the Westerly Land Trust to train them on how to maintain the runnels.
- Conducted a site visit with USFWS staff who are developing educational material on runnels as a restoration strategy to improve marsh health and function and create structured microtopography that could become breeding habitat for marsh dependent species.

Excavator dug runnel at Audubon owned Winnapaug Marsh

Microtopography peat placement at Audubon owned Winnapaug Marsh

NINIGRET POND MARSH: RIDEM

- Conducted site visits to the Ninigret Pond marsh owned by RIDM to assess the condition of the marsh and to construction access for the low ground pressure excavator.
- Conducted masked and distanced hand digging and maintenance of runnels with STB staff and family members in lieu of the organization's pause on engaging volunteers and interns amid the COVID-19 pandemic.
- Identified areas with potential mosquito breeding habitat and excavated runnels to drain the impounded water.
- Drought conditions during the summer and fall of 2020 allowed for assessing the extent of saltwater impounded on the marsh surface in comparison to the extent of a combination of groundwater and saltwater during the spring of 2020. Runnels were extended further inland and the sills were lowered to allow for more drainage of impounded saltwater.
- Worked with RIDEM biologist to assess the long-term maintenance of runnels.

Runnel being dug to drain trapped brackish water on marsh surface at Ninigret East: March 2020

Reduced standing water on marsh platform post runnel excavation at Ninigret East: April 2021

3. METHODOLOGY

The restoration and adaptation methods used at Winnapaug Marsh, Winnapaug Pond, and Ninigret Marsh follow methodology developed by STB in an effort to support the long-term resiliency of Rhode Island salt marshes. STB began implementing runnels to address impounded water on marsh platform in 2010 at a tidal restoration project in Newport. Runnels are small creeks that drain impounded water from the marsh platform and root zone. The runnels follow topographical low areas or flow paths. Unlike ditches, they are shallow and extend up to 12 inches deep to lower the water level on the marsh platform to allow vegetation to recolonize areas. The water that is impounded on the marsh surface and does not drain off at low tide is caused in part due to legacy impacts to the marsh including linear ditch spoils along agricultural and mosquito ditches, agricultural embankments used to hay the marsh and stone walls, and accelerated sea level rise. Based upon regional data of marsh accretion, salt marshes are not building elevation at the rate of relative sea level rise. The purpose of the runnels it to reduce saturation of the root zone and to optimize hydrologic connectivity between the marsh platform and adjacent creeks or ditches.

Example of a hand-dug runnel at Winnapaug Marsh in June 2020.

STB continued refining this technique in consultation with RIDEM's Mosquito Abatement Coordinator and USFWS Land Management Research and Demonstration biologist at Winnapaug marsh using the state's low ground pressure excavator. Since 2010, STB has conducted 14 runnel projects including a Before After Control Impact (BACI) study of a runnel project on the Narrow River in Narragansett, RI in partnership with the USFWS Refuge and the EPA's Atlantic Ecology Division between 2013 and 2019. Results from the study documented a conversion of shallow, impounded water and bare areas to vegetated marsh after the runnels were installed. Monitoring data has documented reduction of impounded water and recolonization of the marsh surface with *Salicornia depressa* (pickleweed) after one growing season and an increase in *Spartina alterniflora* coverage after two growing seasons.

STB and its partners work to minimize any adverse impacts to the marshes. Low impact techniques are employed, including the use of a low ground pressure excavator, digging runnels by hand, conducting the project in phases, reusing any excavated peat to create structured microtopography vegetation, and limiting access during to the marshes during the growing and breeding season.

4. QUALITY ASSURANCE TASKS COMPLETED

As this work does not include the collection or distribution of data for scientific purposes, or the ongoing collection of monitoring data, no QAPP was required under this grant.

5. Deliverables Completed

Linear Feet of Marsh Habitat Supported

- Approximately 1,100 feet of runnels were installed at the RIDEM Misquamicut marsh on Winnapaug Pond and 1,100 square feet of microtopography was created with the excavated peat.
- Approximately 2,100 linear feet of runnels on the Westerly Land Trust and Audubon Society marsh on Winnapaug Pond and 2,100 square feet of microtopography was created with the excavated peat.
- And approximately 800 feet of runnels on the RIDEM Ninigret Pond marsh and 800 feet of microtopography was created with the excavated peat.

Volunteer & Intern Engagement

- Six STB interns participated in runnel creation and marsh assessment activities during the course of this grant.
- Unfortunately, COVID-19 restrictions limited our ability to engage volunteers and interns in the field early on during this grant period.

Salt Marsh Stewardship Program

Prior to the start of COVID, STB's habitat and volunteer management staff were working to develop a volunteer program to train and engage individual volunteers and community groups in being stewards of the organization's many past, present, and future salt marsh adaptation sites. With proper training, volunteers can routinely visit their adopted salt marsh, assessing the marsh for water impounded on the marsh platform, blockages of peat, sediment or vegetation in the runnels, debris on the marsh after coastal storms, and observations of species on site.

Under this grant program, STB began the piloting this process with a small group of 5 volunteers from STB and the Westerly Land Trust. Volunteers were trained in how maintain and assess runnels. A professor from URI participated in runnel maintenance to learn about the adaptive management technique for her wetlands ecology course with the hope of engaging students in the following years in adaptive management projects with Save The Bay. Volunteer stewards will assist staff in assessing and maintaining the runnels. Volunteers participating in stewardship efforts will help STB staff ensure the health and longevity of salt marsh adaptation efforts, even 10 years after completion, and identify any issues of concern immediately. Over the next year, STB will secure maintenance permits for salt marsh restoration and adaptation projects to continue maintaining the runnels once the original permits expire.

Signage for Marshes

An interpretive sign was drafted by Save The Bay's Director of Communication for the DEM Winnapaug Marsh and shared with RIDEM for their review. The final sign was approved by RIDEM on June 10, 2021 and will be sent for printing and installation. Signage at right and within the appendices.

PUBLIC PRESENTATIONS

- STB Director of Habitat Restoration, Wenley Ferguson, presented a summary of our salt marsh adaptation efforts, including the work of this grant funded project, to the Narragansett Bay Estuary Program Steering Committee in June 2020.
- STB Director of Habitat Restoration, Wenley Ferguson, shared the results of the microtopography creation from these restoration sites during a presentation on runnels through a webinar hosted by USFWS in August to over 100 restoration practitioners and USFWS refuge staff and during a session on runnels at the Restore America's Estuaries conference in September.
- STB Director of Habitat Restoration, Wenley Ferguson, shared the results of these salt marsh adaptation projects in a presentation to the RI Salt Marsh Restoration team coordinated by CRMC and the Narragansett Bay Estuary Program in November 2020.

PROBLEMS ENCOUNTERED DURING THIS GRANT PROGRAM

- Due to the late execution of this contract in late November and the frozen marsh conditions in December, we were unable to get much work done at the 3 sites during the fall of 2020.
- Due to COVID-19, STB made the decision to cease all volunteer and intern opportunities with the organization in March 2020. This slowed down the progress we were able to make at each of the marsh sites. STB staff worked in the field with family members, and staff from other STB program areas, to conduct field work in each marsh throughout the grant period.
- At Winnapaug Marsh, the access path to the marsh for the low ground pressure excavator utilized in year one of the grant period, was not available in year two due to a change in ownership of an abutting property. This required STB, Westerly Land Trust and Audubon Society of RI to coordinate plans for a new access site for the excavator.

6. CONCLUSIONS

Through this grant, STB was able to conduct three unique salt marsh restoration and adaptation projects, to restore tidal hydrology through the use of runnels. We continued to learn and refine how to use runnels to restore tidal hydrology impacted by past human activities including ditch spoils, agricultural embankments and vehicle use and as well as accelerated sea level rise. Save The Bay has been installing runnels by hand since 2010 and with the use of RIDEM's low ground pressure excavator in coordination with RIDEM's Mosquito Abatement Coordinator since 2013. We learned through this project how unique site conditions affect how we use runnels to restore tidal hydrology and improve marsh health and function.

WINNAPAUG MARSH: WESTERLY LAND TRUST/AUDUBON MARSH

The marsh on the northern side of Winnapaug Pond is bordered by native and non-native (*Phragmites australis*) and brackish plants. After the installation of runnels in an area of marsh with impounded brackish water, we observed a decrease in the height and vigor of the *Phragmite*s. At the other site, we have documented a reduction of height in Phragmites and have learned that runnels can be a tool to manage *Phragmites*. We also documented a reduction of impounded water in a section of the marsh restricted by an agricultural embankment. Salt marsh vegetation is beginning to migrate inland in this marsh and upland species of shrubs and trees are dying off due to saltwater intrusion. By reducing the impounded water on the marsh platform and in the marsh migration corridor, plants are beginning to recolonize the degraded areas.

As this project was conducted in phases to ensure that impounded water was not drained too quickly to avoid causing subsidence and loss of unconsolidated sediment, the implementation took many more hours than predicted for both staff and volunteers conducting hand digging and using the low ground pressure excavator. Also the extensive *Phragmites* in the marsh required us to uses the excavator for more days than estimated and over two consecutive years.

Future work after the grant period will include ongoing maintenance of the runnels in coordination with the Westerly Land Trust staff and their volunteer stewards and assessment of vegetation response to the runnels in the salt and brackish marsh.

Winnapaug Pond: DEM Misquamicut

The marsh on the back barrier at Winnapaug Pond owned by RIDEM is not affected to the same extent by groundwater as the Audubon and Westerly Land Trust marsh due north of this marsh. Standing water was found at the upper edge of the marsh along the edge of the *Phragmites* but the *Phragmites* did not form as significant a monoculture due to less groundwater influence on this back barrier marsh. Runnels were successfully able to drain this impounded water and allow for vegetation. A section of this marsh was not grid ditched, unlike the rest of the back barrier marsh to the east. Due to the lack of grid ditching, the marsh had more vegetation, but was still exhibiting signs of degradation, including standing water and mosquito breeding habitat at the upper edge of the marsh and filamentous algae growing in the impounded water, a sign of nutrient release from peat decomposition. This project on an un-ditched marsh that was exhibiting signs of significant degradation due to accelerated sea level rise provided a comparison to a former project conducted in 2013 and 2014 on Winnapaug Pond that was grid ditched.

Future work after the grant period will include ongoing maintenance of the runnels in coordination with the RIDEM and Save The Bay salt marsh stewards. We plan to recruit volunteers to help assess and maintain the runnels in this marsh.

Ninigret Pond Marsh: DEM

The Ninigret Pond marsh is also a back barrier marsh but it is at higher elevation and the hydrology is affected by a brackish pond in the middle of the marsh. Inland of the brackish pond, *Phragmites* dominates the marsh and seaward of the pond, salt marsh vegetation has begun to die off due to significant impounded water on the marsh platform. The theory for the degradation of this marsh is that the perched groundwater table is rising with sea level rise, causing more brackish water to become trapped on the marsh both inland and seaward of the brackish pond. The high water table has degraded peat surrounding the pond in both the *Phragmites* and *Spartina alterniflora* dominated marsh. Runnels were extended from the *Phragmites* dominated marsh into the brackish pond, and from the brackish pond into the salt pond. The shallow nature of the runnels provided drainage of the impounded water surrounding the brackish pond without significantly lowering the brackish pond.

Future work after the grant period will include ongoing maintenance of the runnels in coordination with RIDEM. We plan to recruit salt marsh stewards to help assess and maintain the runnels in this marsh.

Save The Bay's salt marsh restoration and adaptation efforts at the three sites – and beyond – helps advance NEIWPCC's five key work areas:

- Connections with local and regional partners to support healthy coastal ecosystems;
- Protection of our local environment through on-the-ground habitat restoration and adaptation projects;
- Training of volunteers and project partners to support ongoing adaptation initiatives at marshes;
- Education of the public, partners, and our future Bay stewards about STB's ongoing work and efforts the public can take to ensure coastal resiliency and the health of Narragansett Bay and its watershed;
- And engagement with local, regional, national and international partners to share the outcomes of our work.

7. REFERENCES

Ekberg, M.L. C., Raposa, K. B., Ferguson, W.S., Ruddock, K. and Watson, E. B., 2017. Development and Application of a Method to Identify Salt marsh Vulnerability to Sea Level Rise. Estuaries and Coasts, 40(3), pp. 694-710.

8. APPENDICES

Appended Documents:

Acronyms

ACOE	Army Corps of Engineers
RI CRMC	RI Coastal Resources Management Council
RIDEM	RI Department of Environmental Management
STB	Save The Bay
USFWS	US Fish and Wildlife Service

Publications

Dorchies, Katy. "Tides Newsletter, spring 2020". Save The Bay. Spring 2020, online and print magazine page 15.
https://www.savebay.org/wp-content/uploads/Tides-Newsletter-Spring-2020-FINAL-for-WEB_compressed.pdf

Photos:

Photos embedded in this document and sent to Project Office. All photos are credit of Wenley Ferguson, Director of Habitat Restoration at Save The Bay and can be used in future publications.

Signage/Materials Created:

As part of this project, a sign on restoring Winnapaug Marsh was created. The draft sign is currently with RIDEM for approvals. A draft of this sign has been included at the end of this section.

Electronic Data:

No electronic data was generated as part of this grant funded project.

Restoring Winnapaug Marsh

Salt marshes support the base of the food chain by providing habitat to fish and wildlife. However, throughout the region, these marshes are threatened by accelerated sea level rise due to climate change.

Salt marsh plants die off when too much water is trapped on the marsh surface.

Shallow, standing water, like what you see above, degrades the marsh and creates ideal habitat for mosquitoes to breed.

Many species rely on salt marsh habitat for food and shelter. Saltmarsh sparrows, for example, nest on the marsh and are especially vulnerable to sea level rise.

Save The Bay and the Rhode Island Department of Environmental Management have partnered to address the impacts of sea level rise on Winnapaug Marsh.

We're digging shallow creeks, known as **runnels**, that will help drain water off of the marsh. Removing the trapped water helps marsh plants recover and grow back.

RIDEM's low ground pressure excavator digs shallow creeks to drain stagnant water off the marsh.

Please respect the marsh and its wildlife.

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